Surface Water Quality Division
Box 30028, Lansing, Michigan 48909

April 17, 1986

Total Petroleum
East Superior Street
Alma, Michigan 48802

Attention: Patrick Lincoln
Ben White
Bernard Shaver

Re: Compliance Sampling Inspection
NPDES Permit No. MI0001066

Gentlemen:

Enclosed please find a copy of a sampling survey conducted at the Total Petroleum facility in Alma by staff of the Lansing District, Surface Water Quality Division on October 1-2, 1985.

On the day of the survey the company met all the parameters in their NPDES permit for their treated process water (See Table 3). There was no rain on the days of the survey, so storm water was not included in Table 3.

When the survey results are compared to the numbers submitted on the October Monthly Operating Reports (Table 3) and when the split sample results (Table 4) are compared, there are some discrepancies. The reason for the significant discrepancies in the suspended solids results was discovered to be the result of calculation errors. These calculation errors were documented by Mr. Art Gedeon of the U.S. EPA on December 3, 1985. Mr. Gedeon conducted a Performance Audit Inspection at the Total Petroleum laboratory. The method of calculation has been changed and thus this discrepancy is considered resolved.

However, Mr. Gedeon's audit of laboratory methods did not indicate any calculation problems or laboratory methodology deficiencies for BOD_5 or phenol. For the DNR Compliance Sampling Survey there are significant discrepancies for these two parameters in both the split samples and in the sample results reported by the company on their MOR's and the results obtained by the survey crew.

The Environmental Protection Bureau laboratory reports a higher value for BOD_5 at 52 lbs/day, while the Total Petroleum laboratory reports 22 lbs/day on the Monthly Operating Report (Table 3). For the split sample for BOD_5 (Table 4), the company reports a higher value at 15.5 mg/l, while the Environmental Protection Bureau reports 9.9 mg/l.

For the split sample for phenol, the Environmental Protection Bureau reports 27 mg/l, and the Total Petroleum laboratory reports 19 mg/l.

Please address these discrepancies for BOD_5 and phenol, and let this office know what corrective actions you are taking within three weeks of receipt of this letter.

If you have any questions, please feel free to contact our office.

Sincerely,

SURFACE WATER QUALITY DIVISION

Bryan D. Morris, P.E., Supervisor
Lansing District

By:

Gloria J. Taylor
Environmental Quality Analyst
517-322-1687

BDM/GJT/slp

Enclosure

cc: U.S. EPA - Region V

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION BUREAU
SURFACE WATER QUALITY DIVISION

Report of an Industrial Wastewater Survey
Conducted at
TOTAL PETROLEUM
All Outfalls No. 290006
NPDES Permit No. MI0001066
Gratiot County
Alma, Michigan
October 1-2, 1985

Survey Summary

Wastewater monitoring was performed during one twenty-four hour survey period starting October 1, 1985.

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Survey Procedure

The flows and samples were obtained as follows:

Sample Description	Flow Measurement	Sampling Method
290024(001) Collected just up from 90° V-notch weir.	Company 90° V-notch weir and staff installed water level recorder.	Automatic air-activated composite sampler and individual grab samples.

A water level recorder provides a continuous account of the liquid level or head above the crest of a weir or through a flume. A head versus time graph is obtained for the duration of the survey period. The total volume of wastewater over the weir or through the flume during the survey period is computed from the graph.

An automatic sampler composites samples at timed intervals. Samples may be proportional to the instantaneous flow over the weir or through the flume.

Extractable organic and sulfide composite samples are collected by the grab composite method.

A grab composite consists of a series of individual grabs composited into one sample.

An individual grab is a single instantaneous sample.

Samples were analyzed by the Environmental Protection Bureau Laboratories located in Lansing.

Samples were preserved according to Table 5. The results of the physical, chemical, and bacteriological analyses are presented in Tables 1 and 2. Letter codes for laboratory results are defined in Table 5. A parameter listing for the organic scans is presented in Table 6. Unless otherwise specified, all parameters in the scan were analyzed.

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Table 1 - Analyses of composite samples.

Outfalls	290024(001)
Survey Period From	10-1-85 1045
To	10-2-85 1045
Computed Flow Rate (MGD)	(0.57)

	mg/l	lbs/day
Suspended solids	10	48
Dissolved solids	2400	11400
BOD_5	12	57
$CBOD_5$	11.	52
COD	120	570
TOC	28.	133
Nitrite & nitrate nitrogen-N	0.11 DS	0.52
Ammonia nitrogen-N	15.	71
Organic nitrogen-N	3.3	15.7
Kjeldahl nitrogen-N	18.0	86
Total phosphorus-P	0.16 DS	0.8
Sulfide	0.04	0.2

	ug/l	lbs/day
Phenols	20	0.1
Total cadmium (Cd)	<20	---
Total chromium (Cr)	<50	---
Hexavalent chromium (Cr+6)	<5	---
Total copper (Cu)	<20	---
Total iron (Fe)	545	3
Total nickel (Ni)	90	0.4
Total lead (Pb)	<50	---
Total zinc (Zn)	90	0.4

Flow rates used in the computation of lbs/day.
Figure shown in ( ) obtained from company/plant MOR/totalizer.

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Table 1 - Continued

Outfalls	290024(001)	
	ug/l	lbs/day
SCAN 3 - Chlorinated Hydrocarbons, Polychlorinated Biphenyl, and Organochlorine Pesticides		
g-BHC (lindane)	<0.01	---
2-Chloronaphthalene	<0.1	---
1,2-Dichlorobenzene	<0.1	---
1,3-Dichlorobenzene	<0.1	---
1,4-Dichlorobenzene	<0.1	---
Hexachlorobenzene	<0.01	---
Hexachlorobutadiene	<0.01	---
Hexachlorocyclopentadiene	<0.01	---
Hexachloroethane	<0.01	---
Octachlorocyclopentene	<0.01	---
Pentachloronitrobenzene	<0.01	---
1,2,4-Trichlorobenzene	<0.01	---
Others	<0.01	---
Aroclor 1242	<0.1	---
Aroclor 1254	<0.1	---
Aroclor 1260	<0.1	---
Aldrin	<0.01	---
BP-6 (PBB)	<0.01	---
a-Chlordane	<0.01	---
g-Chlordane	<0.01	---
4,4'-DDD	<0.01	---
4,4'-DDE	<0.01	---
1,4'-DDT	<0.01	---
4,4'-DDT	<0.01	---
Heptachlor	<0.01	---
Heptachlor epoxide	<0.01	---
Hexabromobenzene	<0.01	---
Methoxychlor	<0.01	---
Mirex	<0.01	---
Others	<0.01	---

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Table 2 - Analyses of grab samples.

Date	Time	Temp.[1] °F	pH[1] S.U.	Susp. Solids mg/l	Diss. Solids mg/l	Diss. Oxygen mg/l	BOD_5 mg/l	$CBOD_5$ mg/l
290024(001)								
10-1-85	1400	58	7.1	4	2400	7.5	11	8.1
10-2-85	0840	50	7.2	4	2400	7.5	9.9	8.4

Date	Time	COD mg/l	TOC mg/l	Nitrite & Nitrate Nitrogen-N mg/l	Ammonia Nitrogen mg/l	Organic Nitrogen mg/l	Kjeldahl Nitrogen mg/l
240024(001)							
10-1-85	1400	120	28.	0.11 DS	15.	2.0	17.
10-2-85	0840	130	27.	0.12 DS	15.	5.1	20.

Date	Time	Total Phosphorus mg/l	Sulfide mg/l	Phenols ug/l	Total Cadmium ug/l	Total Chromium ug/l
240024(001)						
10-1-85	1400	0.14 DS	0.03	25	<20	<50
10-2-85	0840	0.16 DS	0.03	27	<20	<50

Date	Time	Hexavalent Chromium ug/l	Total Copper ug/l	Total Nickel ug/l	Total Lead ug/l	Total Zinc ug/l	Total Iron ug/l	O & G Grav. mg/l
240024(001)								
10-1-85	1400	<5	<20	75	<50	<50	525	4.2
10-2-85	0840	<5	<20	75	<50	90	480	3.2

1 - Values determined in the field at time of sampling.

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Table 2 - (Continued)

SCAN 1 - Purgeable Halocarbons

Date	Time	1,2 Dichloroethane ug/l	Trichloroethane ug/l	1,1,1 Trichloroethane ug/l	Others ug/l
290024(001)					
10-1-85	1400	<18 INT	<1 INT	<1	<1
10-2-85	0840	<1	<1	<7 INT	<1

Date	Time	SCAN 2 - Purgeable Aromatic Hydrocarbons ug/l
290024(001)		
10-1-85	1400	<5
10-2-85	0840	<5

SCAN 3 - Chlorinated Hydrocarbons, Polychlorinated Biphenyl, & Organochlorine Pesticides

Date	Time	Aroclor 1242 ug/l	Other Aroclors, Dichlorobenzenes, 2-Chloronaphthalene ug/l	1,2,4-Trichlorobenzene ug/l	Others ug/l
290024(001)					
10-1-85	1400	<0.14 BLK	<0.1	<0.01	<0.01
10-2-85	0840	<0.14 BLK	---	0.03 BK UC	<0.01

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Table 3 - Comparison of survey results with the facility's NPDES Permit and Monthly Operating Report.

Parameter (Unit)	NPDES Interim Permit Limitations		October Monthly Operating Report				Survey Results[1]
290024(001)	30-Day Average	Daily Maximum	Monthly Average	Monthly Maximum	10-1-85	10-2-85	
Flow MGD	---	0.54	0.454	0.743	0.642	0.533	0.57
$CBOD_5$ mg/l	---	---	---	---	---	---	11(8.1, 8.4)
lbs/day	---	---	28	51	---	22	52
BOD_5 mg/l	---	---	---	---	---	---	12(11, 9.9)
lbs/day	283	510	42	82	38	69	57
Ammonia Nitrogen mg/l	---	---	---	---	---	---	15(15, 15)
lbs/day	146	321	62	83	---	69	71
Suspended Solids mg/l	---	---	---	---	---	---	10(4, 4)
lbs/day	175	296	61	113	67	78	48
Dissolved Oxygen mg/l	---	---	9.1	10.3	---	7.7	(7.5, 7.5)
COD mg/l	---	---	---	---	---	---	120
lbs/day	1870	3600	438	669	567	515	570
Oil & Grease mg/l	---	10	2.8	6.4	3.6	5.0	(4.2, 3.2)
lbs/day	82	154	10	22	19	22	---
Phenol ug/l	---	---	---	---	---	---	20(25, 27)
lbs/day	1.7	3.6	0.042	0.084	0.064	0.084	0.1
Sulfide mg/l	---	---	---	---	---	---	0.04(0.03, 0.03)
lbs/day	1.49	3.25	0.045	0.115	---	0.115	0.2
Hex. Chromium ug/l	---	---	---	---	---	---	<5(<5, <5)
lbs/day	0.15	0.34	< 0.021	0.03	< 0.027	< 0.022	---
Total Chromium ug/l							50(50, 50)
lbs/day	1.86	5.34	< 0.408	---	< 0.535	< 0.444	---
Benzene mg/l	---	0.3	< 0.001	---	---	---	(<0.005, <0.005)
pH (S.U.)	Not <6.0	Nor >9.0	---	7.4	7.0	6.9	(7.1, 7.2)
			MIN	6.4			---

1 - Survey results are for the composite sample. Grab sample results are shown in parentheses ( ). Flows in excess of 0.54 MGD are assumed to be stormwater and are permitted as such.

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Table 4 - Comparison of the laboratory analytical results obtained by Total Petroleum and the Environmental Protection Bureau from the split grab sample.

Outfall	290024(001)	
Sample Date & Time	10-2-85 0840	
	Total mg/l	E.P.B. mg/l
Suspended Solids	17.5	4
BOD_5	15.5	9.9
Ammonia Nitrogen	15.5	15.
COD	116	130
Sulfide	0.026	0.03
	ug/l	ug/l
Phenol	19	27

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Table 5 - Sample Preservation

Parameter	Preservative
COD/TOC/Phenol/Nutrients (Chlorine Absent)	5 drops conc. H_2SO_4/250 ml (to pH <2).
Phenols (Chlorine Present)	Dechlorinated w/ferrous ammonium sulfate (0.141 N). 1 drop/mg/l Cl_2/250 ml. H_2SO_4 to pH <2.
Cyanide/Thiocyanates	Dechlorinate, if needed, with sodium thiosulfate. (1 drop 0.141 N/mg/l Cl_2/250 ml). 10 drops 10 N. NaOH (to pH ≥12)/250 ml.
D.O.	Fixed on site.
Total Metals	2 ml 1:1 HNO_3/250 ml (to pH <2).
Dissolved Metals (Field Filtered)	2 ml 1:1 HNO_3/250 ml (to pH <2).
Microbiology	2 drops 10% sodium thiosulfate/125 ml to dechlorinate sample.
Oil & Grease	10 drops conc. H_2SO_4/250 ml (to pH <2).
Sulfides	10 drops 1M ZnAc/250 ml.
Base-neutral Extractables Purgeable Organics	Dechlorinated, if needed, with sodium thiosulfate. (1 drop 0.141 N/mg/l Cl_2/250 ml).
Acid Extractables	Dechlorinated, if needed, with sodium thiosulfate. (1 drop 0.141 N/mg/l Cl_2/250 ml). 40 drops H_2SO_4/1000 ml (to pH <2).

Samples preserved as required, cooled to 4°C with chain of custody maintained.

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Table 5 - (Continued)

Lab Letter Codes

BK - Reported value has been corrected for a laboratory blank was greater than half of the detection limit but less than half of the reported value.
DS - Sample was diluted due to other high values on a multi-channel analytical system.
UC - No attempt has been made to confirm the identity of the reported compound by a second independent technique due to equipment or sample problems.
BLK - No value reported because the laboratory blank was greater than half of the detection limit and greater than half of the quantified value.
INT - Interference encountered during analysis resulted in no obtainable result.

Survey and Report by: John Ecklund
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Laboratory Analyses by: Environmental Protection Bureau Laboratory